WHAT IS CLAIMED IS:

1. A microfabrication apparatus comprising:

a charged particle gun;

a lens for condensing a charged particle beam emitted from said charged particle gun;

a deflector;

a detectorfor detecting a secondary particle from a sample upon irradiation of said charged particle beam onto said sample;

a specimen stage for retaining thereon said sample;

a specimen-stage position controller for controlling a position of said specimen stage;

a mechanical probe to be connected with a microscopic rod at its tip; and

said microscopic rod wherein a mean area of sections at arbitrary three points of a central portion thereof excluding its tip and root is set to 1 nm^2 to 100 μm^2, and a length of said central portion is set to 20 to 300 times the shortest diameter of said sections.

2. A microfabrication apparatus according to claim 1, wherein a mean value of thicknesses of said microscopic rod at said arbitrary three points of said central portion is set to 1 to 10 μm, and the length of said central portion is set to 50 to 300 μm.

3. A microfabrication apparatus according to claim 1, wherein a mean value of thicknesses of said microscopic rod at said arbitrary three points of said

central portion is set to 1 nm to 10 μm, and the length of said central portion is set to 20 to 300 times said thickness mean value.

4. A microfabrication apparatus according to claim 1, whereina material of said microscopic rod includes at least one selected from the group consisting of tungsten, molybdenum, beryllium, nickel, tantalum, palladium, and osmium.

5. A microfabrication method for use with a charged particle gun, a lens for condensing a charged particle beam emitted from said charged particle gun, a deflector, a detector for detecting a secondary particle from a sample 8 upon irradiation of said charged particle beam onto said sample, a specimen stage for retaining thereon said sample, a specimen-stage position controller for controlling a position of said specimen stage, and a mechanical probe having a microscopic rod at its tip, said microfabrication method comprising the steps of:

(a) contacting the tip of said microscopic rod and a first sample to each other;

(b) fixing together the tip of said microscopic rod and said first sample;

(c) moving said first sample along with said microscopic rod;

(d) cutting said microscopic rod at a root-side portion thereof near a fixing portion so as to separate said microscopic rod and said first sample from each

other;

(e) contacting the tip of said microscopic rod after cutting with a second sample;

(f) fixing together the tip of said microscopic rod and said second sample;

(g) moving said second sample along with said microscopic rod;

(h) cutting said microscopic rod at a root-side portion thereof near a fixing portion so as to separate said microscopic rod and said second sample from each other; and

(i) repeating the steps (e) to (h).

6. A microfabrication method according to claim 5, wherein said steps (a) to (h) are repeated plural times, thereby to extract 10 or more samples, 25 or more samples, or 50 or more samples.

7. A microfabrication method according to claim 5, wherein a mean area of sections at arbitrary three points of a central portion of said microscopic rod excluding its tip and root is set to 1 nm^2 to 100 μm^2, and a length of said central portion is set to 20 to 300 times the shortest diameter of said sections.

8. A microfabrication method according to claim 5, wherein a mean value of thicknesses at arbitrary three points of a central portion of said microscopic rod excluding its tip and root is set to 1 to 10 μm, and the length of said central portion is set to 50 to 300 μm.

9. A microfabrication method according to claim 5, wherein a mean value of thicknesses at arbitrary three points of a central portion of said microscopic rod excluding its tip and root is set to 1 nm to 10 μm, and the length of said central portion is set to 20 to 300 times said thickness mean value.